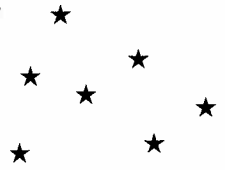


Communication



Background

At the Challenger Learning Center, students accomplish their team goals by following directions on task cards. Each team has two sets of task cards, one for the students at Mission Control and one for the students in the Space Station. The role of Mission Control is to monitor the success of the mission and health/well-being of the crew. They must also assist the Space Station team when needed and when emergencies occur to ensure that the Space Station team is able to complete the activity. Mission Control must always be aware of where the Space Station team is in the task cards so they can relay vital information needed to complete the task. The spacecraft team must follow the directions on the task card step-by-step to accomplish their task. It is important to always read and follow the directions in order to complete a task before going on to the next task card.

Skills

- Following clear and concise directions
- Creating clear directions

Objectives

Students will:

- Use task cards to construct a module.
- Write a series of sequential directions to complete a task.

Overview

In teams of two, students each design a simple object using Lego® bricks. They then create a set of instructions for making their object. They take turns giving verbal instructions to their partner for the construction of their object. During the construction, students are in constant one-to-one verbal contact with their partner.

Key Question

How can we create clear and effective instructions to complete a task?

Key Concepts

- Clear spoken and written language is essential to accomplish tasks.
- Reading and following instructions are skills essential for success.

Materials & Preparation

Each student needs:

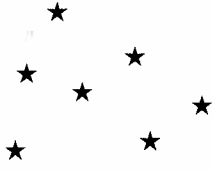
- 10 Lego® bricks of a variety of shapes (and colors)
- Instruction template sheets

1. Pair students into teams of two.
2. Give every student a set of Mission Control task cards and Space Station task cards.
3. Have pairs of students sit next to each other with some sort of border set up between them so that they cannot see each other's work.
4. Working individually, students make a 'module' from the Lego blocks and write down the stages for its construction into Mission Control taskcards numbered 7, 8, 9, and 10.
5. As students complete their instructions, they cut them into cards and make the set of cards into a manual.
6. Assign one student to use the Mission Control task cards and the other student to use the Space Station task cards.
7. Mission Control will transmit instructions for building the module.
8. Once students have completed building the module, have them switch roles and build their teammate's module.

Management

This activity is begun individually and completed in pairs and will take one class period.

The emphasis on clear unambiguous communication is important to the Mission. In order to match the task to students'



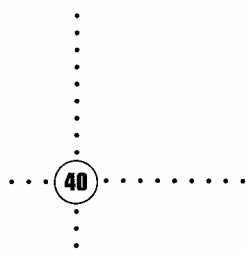
capability, you can vary the complexity of the shape of the Lego module: a 2-dimensional shape with simple bricks for some students through to a complex 3-dimensional shape with a wider variety of bricks for others. To give students a start, you may find it helpful to discuss what to call the various blocks and to use the example set of instructions. Selecting a distinctive color for each type of block gives a powerful additional cue for less-able students.

Reflection & Discussion

1. How clear were your instructions?
2. How well could your partner carry out your instructions?
3. How do you make sure your instructions can be understood?
4. What sorts of things go wrong if communication is unclear?

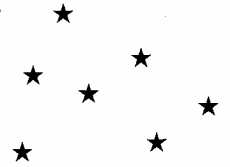
Transfer & Extension

1. Design a space probe with building blocks, then write directions for making the space probe. Sit back-to-back with a partner and transmit the directions to your partner. Was your partner able to build the space probe correctly? How could you improve the directions?



Communication

Mission Control Task Cards



Getting Started

1. Your job in Mission Control is to transmit instructions for constructing the Lego module you have designed.
2. Build a structure using the Legos. On Mission Control task cards 7-10, write instructions for building your module.
3. Choose which of you will be Mission Control and Space Station first. Follow the appropriate task cards in order to build the module.
4. When you "send" a message to your teammate, please use the proper procedures. Say only what is given in this manual. Clear communication is vital to the success of your mission.
5. When your teammate informs you that he/she is ready to begin, turn to the next card.

MISSION CONTROL TASK CARD 1

Test Run: Instructions for building the example Lego Module

1. When you "send" a message to your teammate, please use the proper procedures. Say only what is given in this manual.
2. Send a verbal message to your teammate. You should say:
Space Station, this is Mission Control:
Do you have the Lego blocks as follows?
 - 4 blocks each with 2 rows of 2 buttons "2 x 4 blocks".
 - 4 blocks each with 2 rows of 2 buttons "2 x 2 blocks".**Are you ready to begin? OVER.**
3. When your teammate informs you that he/she is ready to begin, turn to the next card.

MISSION CONTROL TASK CARD 2

4. "Send" the following message to your teammate. You should say:

Space Station, this is Mission Control:

We will now construct the first section of the Lego module.

Place a 2 x 2 block, a 2 x 4 block, and another 2 x 2 block to make a line.

OVER.

5. You may be asked to repeat instructions. Do so quickly. Wait until your teammate tells you that he/she is ready to proceed before moving to the next card.

MISSION CONTROL TASK CARD 3

6. When your teammate is ready to proceed, send this message. You should say:

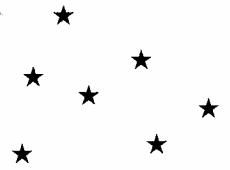
Space Station, this is Mission Control:

Place two 2 x 4 blocks exactly on top to lock the bottom row together.

OVER.

7. Turn to the next card.

MISSION CONTROL TASK CARD 4



8. When your teammate is ready to proceed, send this message. You should say:

Space Station, this is Mission Control:

Now add a 2 x 2 block, a 2 x 4 block, and another 2 x 2 block to form the top row and complete the module.

OVER.

9. Turn to the next card.

MISSION CONTROL TASK CARD 5

10. When your teammate is ready to proceed, send this message. You should say:

Space Station this is Mission Control:

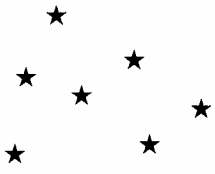
The assembled module should be a rectangle three blocks high and eight studs long.

Is this correct?

OVER.

11. Repeat previous instructions as necessary.

MISSION CONTROL TASK CARD 6



Construct your own Lego module

Write instructions for building your Lego module in the spaces on taskcards 7, 8, 9, and 10.

1. Send a start-up message to your teammate. You should say:

Space Station, this is Mission Control:

Do you have the Lego bricks as follows:

OVER.

2. When your teammate replies that he/she is ready, turn to the next card.

MISSION CONTROL TASK CARD 7

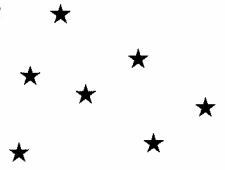
3. Send a message to your teammate. You should say:

Space Station, this is Mission Control.

OVER.

4. When your teammate replies that he/she is ready, turn to the next card.

MISSION CONTROL TASK CARD 8



MISSION CONTROL TASK CARD 9

5. Send a message to your teammate. You should say:

Space Station, this is Mission Control:

OVER.

6. When your teammate replies that he/she is ready, turn to the next card.

MISSION CONTROL TASK CARD 10

7. Send a message to your teammate. You should say:

Space Station, this is Mission Control:

OVER.

8. When your teammate replies that he/she is finished, see if their module matches your original design.

Communication

Taking instructions from Mission Control

1. Your job in the Space Station is to construct a Lego module with guidance from Mission Control. You have all of the materials necessary to build the Lego module and your teammate in Mission Control has all of the necessary instructions.
2. You will have one-to-one contact with your teammate in Mission Control.
3. You will need to follow the step-by-step instructions transmitted by your teammate and construct the Lego module according to those instructions.
4. When you send a message to your teammate, please use the proper procedures. Say only what is in this manual.
5. Make sure you have all the necessary materials. You will need the correct Lego blocks.

SPACE STATION TASK CARD 1

Communication protocols:

READY: When your teammate asks if you are ready to begin, "send" your reply. you should say:

Mission Control, this is Space Station.

I am ready to begin.

OVER.

HELP: Follow the instructions carefully. If you need the instructions repeated, send a message to your teammate. You should say:

Mission Control, this is Space Station

Repeat that instruction.

OVER.

PROCEED: When you have completed an instruction, send the following message. You should say:

Mission Control, this is Space Station.

I have completed those instructions. Proceed.

OVER.

SPACE STATION TASK CARD 2